

## REMARKS

By this Amendment, Applicants propose amending claim 1 to more appropriately define the invention. Upon entry of this Amendment, claims 1-9 will be pending.

In the Final Office Action, the Examiner rejected claims 1-9 under 35 U.S.C. § 112, second paragraph; rejected claims 1 and 6 under 35 U.S.C. § 102(b) as anticipated by Admitted Prior Art ("APA"); rejected claims 1-6, 8, and 9 under 35 U.S.C. § 103(a) as unpatentable over APA in view of Cooper et al., U.S. Patent No. 5,219,793 ("Cooper"); and rejected claims 7 and 8 under 35 U.S.C. § 103(a) as unpatentable over APA in view of Chang et al., U.S. Patent No. 6,159,842 ("Chang") and further in view of Tsai et al., U.S. Patent No. 6,331,480 ("Tsai"). Applicants address these rejections separately below.

### **I. Response to Rejections under 35 U.S.C. § 112, second paragraph**

The Examiner alleged that the claim recitation "forming insulating layers on sidewalls of the bit line patterns," recited in claim 1, is indefinite because, according to the Examiner, it is unclear how the insulating layers forming on the sidewalls of the bit line patterns without exposing the bit line patterns first.

Claim 1 recites, *inter alia*, "c) etching the interlayer insulating layer with an etching mask defining a straight line shape, and forming a straight line shaped contact opening between neighboring bit line patterns; and d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening" (emphasis added). Applicants submit that these recitations clearly define that insulating layers are formed on the side walls of bit line patterns because the contact opening is formed prior to the formation of the sidewall insulating layers. Thus, Applicants submit that claim 1 is

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definite. Accordingly, Applicants request that the Examiner withdraw the rejection of claims 1-9 under section 112, second paragraph.

## **II. Response to Rejections under 35 U.S.C. § 102(b)**

The Examiner alleged that claims 1 and 6 are anticipated by APA. In response, Applicants assert that APA fails to anticipate claims 1 and 6 because APA fails to teach all of the claim elements.

In order to properly anticipate Applicant's claimed invention under 35 U.S.C. § 102(b), each and every element of the claim in issue must be found, either expressly described or under principles of inherency, in a single prior art reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." M.P.E.P. § 2131 (8<sup>th</sup> Ed., Aug. 2001), (quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989)). Finally, "[t]he elements must be arranged as required by the claim." M.P.E.P. § 2131 at p. 2100-69.

Claim 1 is directed to a method for forming contact openings comprising a combination of elements including, *inter alia*, "b) forming an interlayer insulating layer on the first resulting structure; c) etching the interlayer insulating layer ... [and] d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening."

APA is directed to a method of forming a conventional contact hole. APA discloses that the method comprises forming a spacer 24 on sidewalls of bit line patterns 21A and depositing an interlayer insulating layer 25. (specification, Fig 2D). However, spacer 24 is formed on the sidewalls of the bit line patterns before depositing and etching the interlayer insulating layer 25. (See specification, Figs. 2A-2D). Thus,

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APA fails to teach forming and etching an interlayer insulating layer and then forming insulating layers on sidewalls of bit line patterns.

Therefore, APA fails to anticipate claim 1 because APA fails to teach all of the claim elements. For at least this reason, claim 1 is allowable.

Claim 6 is allowable at least due to its dependence from allowable claim 1.

### **III. Response to Rejections under 35 U.S.C. § 103(a)**

The Examiner alleged that claims 1-6, 8, and 9 are unpatentable over APA in view of Cooper and that claims 7 and 8 are unpatentable over APA in view of Chang and further in view of Tsai. In response, Applicants submit that a *prima facie* case of obviousness has not been established for these claims.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Furthermore, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." M.P.E.P. § 2143.03, (quoting *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970)). Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. See M.P.E.P. § 2143 at pp. 2100-122 to 127.

A *prima facie* case of obviousness has not been established in either rejection because the cited references fail to teach or suggest all the claim elements. Applicants will address each rejection separately.

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### **A. Claims 1-6, 8, and 9**

Claim 1 recites, *inter alia*, "b) forming an interlayer insulating layer on the first resulting structure; c) etching the interlayer insulating layer ... [and] d) forming insulating layers on sidewalls of the bit line patterns only exposed through the contact opening."

As mentioned above, APA fails to teach forming and etching an interlayer insulating layer and then forming insulating layers on sidewalls of bit line patterns. (current amendment, remarks, section I.).

Furthermore, the Examiner does not allege that Cooper teaches or suggests these claim steps. In fact, Cooper also fails to teach or suggest these steps. Cooper merely discloses forming an insulating layer 22 and an etching layer 20 using a photoresist mask 24. See Cooper, Fig. 2 and col. 4, lines 38-67.

Thus, a *prima facie* case of obviousness has not been established because APA and Cooper, taken alone or in combination, fail to teach or suggest all the claim elements. For at least this reason, claim 1 is allowable.

Claims 2-6, 8, and 9 are allowable at least due to their dependence from allowable claim 1. "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." M.P.E.P. § 2143.03, p. 2100-126, (citing *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988)).

### **B. Claims 7 and 8**

Claims 7 and 8 depend indirectly from claim 1, and, thus, incorporate the elements of that claim. As mentioned above, APA fails to teach forming and etching an interlayer insulating layer and then forming insulating layers on sidewalls of bit line patterns. (current amendment, remarks, section I.).

Likewise, Chang and Tsai fail to teach or suggest at least this claim element. In fact, neither Chang or Tsai teach or suggest forming insulating layers on sidewalls of bit line patterns. See Chang, Fig. 3 and Tsai, Fig. 12.

Thus, a *prima facie* case of obviousness has not been established because APA, Chang, and Tsai, taken alone or in combination, fail to teach or suggest all the claim elements. For at least this reason, claims 7 and 8 are allowable.

#### **IV. Conclusion**

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing claims 1-9 in condition for allowance. Applicants submit that the proposed amendment of claim 1 does not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

Furthermore, Applicants respectfully point out that the final action by the Examiner presented some new arguments as to the application of the art against Applicants' invention. It is respectfully submitted that the entering of the Amendment would allow the Applicants to reply to the final rejections and place the application in condition for allowance.

Finally, Applicants submit that the entry of the amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

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Please grant any extensions of time required to enter this response and charge  
any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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